TITLE: CYANOBACTERIAL CULTURES ASSOCIATED MICROBIOME FROM ABROLHOS REEF BANK

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Cyanobacteria and heterotrophic bacteria can establish diverse ecological and metabolic relationships resulting in a reciprocal and dynamic interaction with natural environments. Cyanobacterial cultures are rarely free of heterotrophic microbes, which are believed to be crucial for cyanobacterial cells survival, confirming the intimate association between those microorganisms. Although associations between cyanobacteria and heterotrophic bacteria in environmental and cultured systems have been fairly described, the exact nature of these relationships is poorly understood. Intriguingly, the classification of heterotrophic bacteria associated to most of the studied cyanobacterial cultures is yet to be unraveled. Further knowledge about such systems is central to understand the role developed by each associated microorganism, not only revealing their ecological functions but also allowing future biotechnological applications. The present study aimed to describe heterotrophic bacteria associated with marine cyanobacteria isolated from turfs of Abrolhos marine national park, available at Culture Collection of Microorganisms at the Federal University of Rio de Janeiro. Strains of cyanobacteria were cultured in F/2 medium. The clone library based on phylogenetic molecular marker 16S rRNA was used to access the diversity of microbes present in the cultures. Pure cultures of heterotrophic bacteria were isolated in DIFCO 2216 plates and their identification has done based on 16S rRNA. Most of the identified OTUs belong to the genus *Acrophormium*, a filamentous cyanobacteria, whereas about 15% were found to be heterotrophic bacteria classified into three classes: *Alphaproteobacteria*, *Gammaproteobacteria* and *Bacteroidetes*. These results indicate a pattern observed in most cyanobacterial cultures, in which a single cyanobacteria strain is cultivated in a non-axenic culture. Groups of heterotrophic bacteria reported as 'helper bacteria' in cyanobacterial cultures were found in the libraries and isolated in pure culture. The public genomes database available of the microorganisms identified into the systems indicates metabolic pathways diversity and the potential to produce secondary metabolites and pigments. Therefore, mining the complex biological system of cyanobacterial co-cultures allows understanding the success of the turf formation at Abrolhos and increases the potential use of these microorganisms and their genomic repertoire to biotechnological applications.

Keywords: Abrolhos reef bank, Biodiversity, Biotechnology, Cyanobacteria, Heterotrophic bacteria.

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